METHOD AND DEVICE FOR PROVIDING CONFERENCES

CLAIM FOR PRIORITY

This application claims priority to German application
5 Application No. 10238286.7 which was filed in the German
language on August 21, 2002, the contents of which is
hereby incorporated by reference.

TECHNICAL FIELD OF THE INVENTION

10 The invention relates to a method and a device for
providing conferences, and in particular, by providing a
control interface between a recognition or
announcement/dialog function and a conference management
function.

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BACKGROUND OF THE INVENTION

With the prior art, services for audio conferences are
part of the essential range of services offered by voice
switching networks. They are provided by the switching
20 centers of the network or even by network elements
external to the switching centers. The conference
function here is based on a combined function for the
audio stream of the participating conferees, which is
provided by a specific hardware unit with DSP capacity
25 (Digital Signal Processor).

In conventional cases, where the useful channel of a
connection is fed to the switching center, the conference
functions and the announcement and tone functions
30 required for these can be provided by peripheral devices
or external devices equipped with corresponding
functionality. If, however, the useful data is conveyed
outside the switching center in a packet network,
preferably at least one external conference system is
35 used for this. The system has interfaces with the packet
network for the useful data of the conference. The useful
data of the conference here is either the useful data of
the individual conferees or the announcements/dialogs and

tones to be input as well as the combined signal to be distributed to the conferees, which is generated via at least one conference bridge. The external conference system can also have a control interface with the

5 switching center controlling connections in the packet network conveyed outside the switching center, in order to control the required basic functions during the conference or to initiate the interspersion of announcements/dialogs and tones generated in the external

10 conference system for example.

Essentially conference services have a range of conference features, which can be differentiated and defined in respect of the initiation and control of the

15 progress of the conference:

There are on the one hand conference features, with which users are included as participants by DIAL-IN (dialing of the conferee into the conference) or by DIAL-OUT (calling

20 of the conferee out of the conference), i.e. the conference process is characterized by the availability of the conferees (e.g. by connecting participants to the conference or the departure of participants from the conference).

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On the other hand, there are conference features which are characterized by the conference leader or the conferees of the controlled conferences. For example, conferees can be connected, switched to silent or

30 disconnected from the conference by a conference leader by means of appropriate DSS1 signaling (ETSI ADD-ON conference) or via an additional graphic control system on a PC-type terminal. These conference features controlling the conference are often available to the

35 Conference Service Operator, who can manage the conference resources in the network and monitor the conference service.

With regard to videoconferences, which are increasingly used in packet-based networks, the need for conference control is increased by the participating conferees, who increasingly wish to influence the image to be viewed.

5 This includes the selection of one or more participants during the conference, voice-activated switching of the image to the conferees speaking at the time, simultaneous image availability for a certain number of conferees and the additional insertion of documents.

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Conversely, existing conference solutions inform the participants currently in a conference about the inclusion of a further conferee in the conference or the fact that a conferee has left the conference by means of

15 conference tones and/or by means of generally few conference announcements of corresponding content.

With regard to the initiation and control of conferences, the following distinction is made between conference

20 services:

With the ETSI-ADD-ON conference, control is by definition only possible in a local switching center. It is initiated and controlled via conferee signaling

25 (numerical sequence control). It is primarily available in TDM-based but also in packet-based networks, the switching centers of which support conventional participant signaling and can be initiated directly (AD HOC).

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The PRESET conference represents a compromise between AD HOC initiation and a simultaneously predefined conferee list.

35 The PHONEMEET conference is offered as a general network service (public conference). This service, which is very similar to the internet chat service but is much longer established, provides a Service Code, which can be used

to dial into a conference on a specific topic and have discussions with conferees who have already dialed into the topic. Conferees do not generally identify themselves and have no guarantee that they will be connected to a
5 repeat joint conference when they dial in again. The characterizing feature of such a service is that participants, who generally do not know each other, can have discussions in the public network. No control by conferees is required, and automatic monitoring of
10 disruptive parties is not available. Some network operators have operators to monitor conference availability and the undisrupted progress of the conference, the operators identifying and isolating hostile disruptive parties by sporadically listening in.
15

Pre-reserved conferences are available as DIAL-IN, DIAL-OUT or MIXED DIAL-IN/DIAL-OUT conferences. They are particularly useful for business customers. One disadvantage is that pre-reservation and conference
20 planning have to be carried out manually and there is therefore no AD HOC availability.

For the purposes of completeness, reference should be made to conference services with Web-based operator
25 interfaces (such as Siemens SURPASS WEBCONFER) and TERMINAL conferences, which are supported according to certain signaling standards. The former can be booked and controlled via internet access. The advantage of Web-based control with Status Display is limited by the
30 disadvantage of internet access with the possible requirement of an additional terminal for the conference leader and lack of interaction with the conferees. TERMINAL conferences are for example conferences for audio, video and data, which depend on the terminal
35 functions and are possible with the specifications of the H.323 Standard (or even the SIP Standard), with which conventional terminals cannot be used. A central bridge is superfluous here. Major conferences with a large

number of participants are however not possible due to
the limited performance of the terminals. A further
disadvantage is the increased bandwidth requirement
between conferees.

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Resources have to be made available in the network for
all conference services. As conference services represent
a cost-intensive investment for network operators, they
are not made available to an unlimited degree in the

10 network. This means increased control costs; for as well
as the interactions between the conference leader and the
participants during the conference, the time and date of
the conference have to be agreed, the availability of the
conferees and the appropriate conference resources has to

15 be established and participants have to be informed of
the time and access authorization, to ensure the success
of the conference.

Conferences which can be initiated on an AD HOC basis

20 from experience have a control interface characterized by
numerical sequence control of the telephony or a graphic
control interface connected to a higher quality,
intelligent, possibly additional, terminal, which set the
limits for the sporadically immediate operability of any

25 terminal. The system tones and announcements made
available to the conferees only allow general conclusions
about the progress and status of the conference. As far
as pre-reserved conferences are concerned, in some
circumstances significant manual interaction is required

30 before the start of the conference. Such impediments make
the deployment, use and success of conference solutions
problematic.

SUMMARY OF THE INVENTION

35 The invention generally relates to simplified operation
and control of conference services.

In one embodiment of the invention, there is a control
interface provided between an announcement/dialog
function and a conference management function, and a
voice recognition functionality is provided. This
5 considerably simplifies the preparation and
operation/control of conference services. For example,
the functional input via numerical sequences controlling
the conference is no longer necessary, as the techniques
based on the voice recognition functionality support a
10 user-friendlier dialog between man and machine. Input can
therefore be easily corrected by participants or
operators. Essentially, operation is simplified for all
currently known conference types in TDM and packet-based
network environments, in particular for DIAL-IN, DIAL-
15 OUT, MIXED DIAL-IN/OUT, ETSI ADD-ON, PHONEMEET
with/without operator monitoring, PRESET conference.

The conference functionality, in particular of
conferences initiated on an AD HOC basis, is also
20 decoupled from participant signaling and made available
at remote level (i.e. more generally in further switching
systems possibly belonging to competitor network
operators). Additional devices with graphic operator
interfaces are not necessary and operator input is
25 minimized in respect of monitoring, booking and/or the
procedural organization of conferences.

One advantage of the invention is the positive impact on
conference services. The ETSI ADD-ON conference
30 functionality is not only available and easy to operate
in the local switching center, but also in any TDM-based
or packet-based network through the use of techniques
based on (DTMF) voice recognition, to overcome the
restrictions of participant signaling. Techniques based
35 on voice recognition are advantageously used, when
compressive coding methods are used particularly in
packet-based networks, which do not guarantee disruption-
free DTMF transmission. Booking and management processes

for conference services can also be automated using corresponding IVR logic (Interactive Voice Response), such as recognition of disruptive parties and intercept initiation and control of follow-up activities by voice
5   recognition mechanisms.

BRIEF DESCRIPTION OF THE DRAWINGS
The invention is described in more detail below with reference to the drawings, in which:
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Figure 1 shows the basic relationships in the network.

Figure 2   shows the network elements and interfaces
              incorporated to eliminate disruptive parties in
15   a conference.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS
Fig. 1 shows the basic relationships according to the invention. In this embodiment, there is a public TDM-
20   based or packet-based, in particular IP-based network, in which at least one announcement and dialog function IVR, one conference management function KM and at least one conference function KF are available in order to provide user-friendly conference services.
25

Fig. 1 also shows, for example, 4 users B1 to B4, who wish to take part in a conference. These 4 conferees are served and controlled by a switching system Vst. Fig. 1 also shows a number of mutually independent conference
30   systems K, in which the conference function KF is operating. Interface devices MCU can also be seen to be part of a conference system and these should be seen as the ends of the useful data streams from and to the conferees.
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The conferees' useful data is switched through under the control of the switching center Vst and fed to these

interface devices MCU. The useful data streams are also combined here.

The conference function KF essentially represents a
5 conventional combined function of multiple input signals for audio or video signals. It also supports the distribution function for further information as well. The platform to be provided for this is characterized by telephony interfaces for adaptation to the network and
10 signaling as well as by DSP-based combined functions for the audio stream and where appropriate further functions for controlling video output (e.g. Voice Activated Video Switching).

15 Conference features such as DIAL-IN or DIAL-OUT are supported in conference connections by the conference function KF and their descriptive data is supplied via a control interface to a conference management function KM. The latter can intervene in a controlling manner at any
20 time in the configuration of an ongoing conference via this interface. The SNMP protocol is used for example as the protocol between the conference management function KM and the conference system K.

25 There are conferees who are distinguished in that their input useful data stream is accessed before inclusion in the combined conference signal and fed to an announcement and dialog function IVR for a certain time for the purposes of monitoring for disruptive activity or to
30 identify legitimate input controlling the conference (e.g. by the conference leader). An announcement and dialog function IVR can be permanently or temporarily assigned here via a control interface S between the announcement and dialog function IVR and the conference
35 management function KM.

The announcement and dialog function IVR operates on at least one separate device or if necessary even collocated

with the function KM described in more detail below on a device VoxP. It is used for dialog management with input recognition for the conference leader or the conferees, with DTMF input, menu-driven dialog or preferably keyword

5   spotting in the natural dialog being used. The hardware platform required for the announcement and dialog function IVR is generally characterized due to the performance required in public networks by telephony interfaces, which undertake adaptation to the network

10 technology and signaling, as well as by hardware and software, which carry out voice recognition tasks (e.g. DSPs, voice recognition algorithms).

The conference-specific dialog processes necessary for

15 the announcement and dialog function IVR are stored appropriately on a content server CS, e.g. in the form of VoiceXML scripts, which are produced based on the conference configuration and give the complete dialog sequence for the IVR system.

20

Fig. 1 also shows a conference management function KM, which is configured as a software function and which operates on a device VoxP. This monitors and supports the status of the conference systems K and their ports

25 generally and where necessary network-wide. A further functionality is the reservation of conferences booked in advance, the prompt activation and monitoring/control of the conferences themselves and the generation of charge tickets, in particular with regard to the reservation of

30 resources in the network. Booking data and charge data and where necessary error indices as well as traffic and statistical data are stored on a database server DB by the conference management function KM.

35 According to one embodiment of the invention, the announcement and dialog function IVR has a control interface S with the conference management function KM, with which it is able to output booking data for a

conference or the initial conference parameters of an AD
HOC conference to the conference management function for
further processing. Conversely, the announcement and
dialog function IVR receives information where necessary
5   about the resource requirement, which can be covered at
present or for the intended booking period from the
conference management function and where necessary charge
information for configuring the dialog with the party
ordering the conference/the conference leader.
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The conference management function has an overview of the
availability of conference resources, if necessary
network-wide, and can therefore in particular support and
reserve conferences which extend over a number of
15   conference systems (cascading) because of their size or
in the event of resource shortages.

Finally, for reasons of fail-safety, the database server
DB, content server CS, conference management function KM,
20   announcement and dialog function IVR and the conference
function KF are at least duplicated. The functions do not
necessarily have to be set up on different hardware
platforms. The IVR function and KM function in particular
can be set up on different hardware platforms.
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Fig. 2 shows an application of the method according to
the invention, where conferees emitting disruptive
signals, hereafter referred to as disruptive parties, can
be eliminated in an automated manner from a conference.
30   This means that an automated operator operates in the
place of a human operator. A PHONEMEET conference can for
example be considered here. As this conference service is
subject to charges, the network operator is concerned to
ensure and monitor the availability of the service.
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Automated operators are therefore preferably used. These
preferably connect in succession to an ongoing PHONEMEET
conference, to verify that no disruptive parties are

participating in the conference. The latter are typically
characterized by the inputting of disruptive tones or by
abusive language. Conferees disrupting in this way are
then eliminated by the operator from the conference or at
5   least switched to silent. Attempts will also be made to
proceed in the same manner in the event of indecent
contributions or even legally prohibited content.

In order that the operator can eliminate just the
10   disruptive parties from the conference when such are
identified, without having to disconnect the entire
conference, the control unit of the conference system
allows the operator to dial in or switch to the entire
conference and to dial in or switch to each conferee in a
15   PHONEMEET conference. This means that the operator is
able to select the conference in question and thus locate
a possible disruptive party.

Fig. 2 shows the network elements and interfaces required
20   for this. The processes are preferably automated using
voice recognition algorithms with key word spotting. In
this way a recognition system or even an IVR system
obtains access to PHONEMEET conferences in succession
and monitors the conference (e.g. K1, K2, K3) first. If a
25   disruptive party is identified on the basis of high sound
levels, identification of abusive language by the voice
recognition system or other criteria, the recognition
system/IVR system switches in succession to each
individual conferee, to carry out a detailed check. The
30   recognition system/IVR system obtains the data for
switching via the conference management system from the
database DB, which includes the number of PHONEMEET
conferences and their characteristics, such as maximum
number of participants and accessibility for the monitor
35   function. Switching can be achieved by dialing into the
conference system K, as shown in Fig. 2 or via the
control interface of the conference system. The
conference system identifies from the signaling of the

higher order switching center, e.g. from the A call
number of the recognition system/IVR system or access via
the control interface that this is a routine switch on
the part of an operator function, which does not generate
5   perceptible indices in respect of the conferees being
checked or other conferees.

If a switch to a specific conferee is requested, the
conferee's input stream into the conference is also
10 forwarded to the recognition system/IVR system. This is
shown symbolically in Fig. 2 by the insertion of a
further intercept point, which in some circumstances does
not however reflect the actual hardware relationships.
The switch to one conferee or the entire conference can
15 be terminated via a command interface or by the
recognition system/IVR system or the conference
management system canceling the switch connection.

When an individual disruptive party is detected and
20 identified, the recognition system/IVR system prompts the
conference system to isolate it. This can take place
preferably via the control interface of the conference
system but can alternatively be achieved by appropriate
dialing in to signal the wish to disconnect or silence a
25 specific conferee. If the disruptive party is switched to
silent, it can continue to listen to or watch the
conference or alternatively an announcement can be played
by the IVR system to clarify isolation status and the
follow-up measures taken (switching to silent or
30 disconnection from the conference). Expediently, the
conference management system stores the data of the
disruptive party (e.g. the A call number), as available,
in a data storage unit, e.g. in the database of the
content server CS.
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The prompt by the monitor function to eliminate the
disruptive party can be given via the operator interface
of the VoxP device. Monitoring details are stored in the

form of VoiceXML scripts on the content server CS. The VoiceXML pages including the conference points currently available and to be checked can be generated by the content server CS using the status parameters obtained

5   from the database DB and supplied by the conference management function KM.

As an alternative for small network configurations with, for example, one conference server, the

10   recognition/IVR/conference management function can also operate on the conference server itself.

In the above application the IVR system is used as a recognition system. If clarifying announcements are to be

15   played to the isolated participants, a recognition system with announcement functionality is preferablyused. The availability of a full interactive recognition and response function, in other words full IVR functionality, is required if the disruptive party, when switched to

20   silent, is to be offered a dialog offering a range of different options (e.g. complaint function, etc.).